such ratio, that when wholly or proportionally reflected or transmitted, they neutralize each other, and produce white or neutral grey (which is merely a shade of white, having no predominant colour); and light producing them in such ratio is often called shortly *white* or *neutral light*. In 100 parts of white, there appear to be about 18 parts of yellow, 32 of red, and 50 of blue, all of equal intensity, or nearly as 3, 5, 8. When two only of the primary colours occur, yellow and red, yellow and blue, or red and blue, they form the secondary colours, orange, green, or purple; and when they occur in the ratio in which they are produced by white light, they form perfect or normal secondaries. The colour of those objects which are called coloured, is caused by their having the quality, from their peculiar structure, or otherwise, of reflecting or transmitting different parts of the rays forming the compound light to which they are exposed, the remainder being absorbed and extinguished."

In ordinary artificial light, the rays producing red and yellow appear to occur nearly in the same ratio in which they occur in white light. "And as there is an excess of them over the rays producing blue, all that is necessary, in order to produce white light, is to interpose a transparent medium of such a depth of blue as to absorb that excess, allowing such a portion of them to pass as is necessary to neutralize the rays producing blue, all of which have been allowed to pass. It appears that that excess may be best absorbed by interposing coloured glass, of a proper depth of blue, according to the ratio of orange in the flame. It ought to be 'coloured' glass, that is, coloured in the melting-pot. Glass 'stained' blue, that is, partially coloured by applying the colouring matter to the surface, and fixing it by a heat sufficient to soften the glass, but not to melt it, is not transparent; in which respect, blue differs from other stained colours in general."

"The artificial light is to be inclosed in a box or lantern of a suitable size and construction, or otherwise, as circumstances may require, and in such manner that none of it may escape by the openings for admitting and discharging air or, otherwise, except what is modified by passing through the coloured medium."

The paper shews how best to adjust the depth of tint of the glass. In obtaining white light by the method proposed, there is of course a loss of a large portion of the artificial light, and a corresponding increase of expense; but it appears that the objection on this ground is not so great as might be anticipated. "Dr. Fyfe states the following among the results of observations made by him with regard to the expense of a variety of materials for producing light, taking as the unit the expense of good coal gas, yielding 12 per cent. of matter condensible by chlorine: — Gas argand, 1·00; gas swallow-tail, 1·40; solar oil in solar lamp, 2·00; solar oil in common argand lamp, 3·98; whale oil in ditto, 5·00; sperm in ditto, 8·00; moulded candles (short sixes), with two wicks, 12·70, with one wick, 13·50; wax candles, 25·00; spermaceti and composition candles, 29·20. So that, supposing the expense of white light to be six times that of ordinary artificial light, it may be produced by a gas argand lamp for little more than the expense of the same quantity of orange light from common whale oil in an argand lamp, for about half the expense of tallow candles, and for less than a fourth part of the expense of wax candles; and if gas cannot be obtained, the solar lamp may be used, which will produce white light at the same expense as orange light from tallow candles, and at less than half the expense of wax candles, independently of the diminution of the ratio of orange, in consequence of the great brightness of the flame of that lamp."

We look upon these hints by Mr. Tait, for the production of artificial daylight, as likely to prove of considerable value.

GROSVENOR-SQUARE.—A resident in Grosvenor-square implores us to urge the importance of completing the sewers in that neighbourhood, which have long kept the inhabitants in a state of great discomfort. In cases of this sort every effort should be made to get the works completed with the utmost rapidity, whereas it would seem here that those engaged are in no hurry to get done. Who is to blame?

THE NEW HOUSES OF PARLIAMENT AND PROGRESSIVE RISE OF THE RIVER.

SIR,—As you inserted a paper of mine in yours of the 9th of January ult. (and to which I now refer), on the effect of the rise of the river Thames, I take the liberty of submitting my opinion as to the cause of such an interesting hydrographical consequence.

The basin of the river Thames is considered to comprise an area of about 5,500 square miles. The bed of the upper part of the river probably is not much altered, owing to the descent there; it being computed, that the fall from Oxford to Maidenhead is about 25 feet per ten miles, from Maidenhead to Chertsey about 22 feet, from Chertsey to Mortlake about 16 feet; and from Mortlake to London about one foot per mile.

Rivers occupy the lowest part of the valleys through which they run, and when rivers are large, the declivities are generally small, and the downward impetus, when diminished, and particularly when opposed by a flood or returning tide, produces a considerable *deposit of sediment*. At the mouth, or more correctly speaking, the *end* of the Thames, the river being so wide there, it will be found, by comparison of the level of the upper surface of the adjacent marshes, that the deposit is less in depth in that part of the river, owing probably to its being more diffused. The narrower part of the river, such as between Sea Reach and Wandsworth, has the most to do in this business; and *there*, affected by the flood tides, is the greatest deposit. This, I have calculated, may amount to a rise of from 18 to 24 inches in each century. Upon this principle, I imagine that the bed of the river Thames, many centuries ago, was much lower than it is at present; and that all the marshes at that time, and also the ground at Millbank, &c., were above high-water level. The water of the Thames in the part alluded to is frequently so turbid as to resemble in colour and consistence thin pea-soup; this matter cannot return and ascend the river, where is no returning tide, but only obeys a downward stream, and the sea appears inclined to reject it, and therefore much of it remains and disfigures the river. I have no doubt the quantity of this stuff is greater now than it was formerly, owing to the very increased extent of the metropolis, and the consequent greater discharge from its sewers.

As the bed of a river becomes higher, the whole body of the water must rise in a proportionate degree;—for the river acts as a gutter, and it must be evident, that if a gutter has a certain quantity of work to perform, and the lower part be loaded with sand and dirt, the upper surface of the travelling water must be higher. I am confident that there can be no objection to my theory on account of a supposed level of the tidal wave, because the same is not uniform: for instance, the difference between low water and high water is great at Guernsey, and but small at Weymouth.

To revert to an early period, I have seen at low ebbs, a little above Rainham Ferry-house, the remains of large trees in position, with their roots. These are *not in a fossil state*; they are black, and like soft charcoal. This soddened decomposed wood is frequently found in the river, and is called by the fishermen and sandmen "moor logs." The same occurred at Greenwich at about the same level, and occasioned much inconvenience as to the driving of the piles for the pier there. It is probable that these woods were in existence about our Saviour's time. I should observe, that my attention was at first attracted only to the question as to the origin of the formation of the marsh walls; I afterwards referred to ancient buildings to support the position I had taken. These marsh walls have hitherto been attributed to the Romans, probably under the idea that no other people in this country could have undertaken a work of such great labour as the *recovery* of so much land, many feet below the ordinary level of high water. In 1734 a breach occurred in the marsh wall at Dagenham, and as the repair of it cost 25,000*l.*, how is it possible that the whole marsh wall on both sides of the river could have been made by any nation at one time? It appears evident to me, that when the bed of the river became so elevated that the rise of the upper surface of the water began to injure the marshes, that the *walls were then commenced*; and this at first, being a work of comparatively slight labour, was not noticed by historians, any more than the first formation of roads in a country when nearly uninclosed would be. In my time, I remember additions in the height of the marsh wall at many places after high tides.

Another proof of the alteration of the upper surface of the river is in respect of St. George's-fields, where the Romans, it is said, had an important station. This has been disputed by modern historians, who have considered that place to have been a swamp, owing to its being now a little below the present line of high water.

My attention has been particularly called to this point, because I have seen, on excavations being made in the New Cut, and in several parts of St. George's-fields, that within about a foot of the present surface there was *clean bright gravel*, from which it is evident that that neighbourhood had never been subject to inundations.

Three years ago they were digging a section from the deeply-situated sewer at Westminster-bridge (the northern boundary of Thorney Island) to low water mark. The progressive deposit of the river was here evident; they came at last to a floor of sand, which I have every reason to consider was the shore when Westminster was selected as the site for the royal palace. The sands on the shores of the Thames have been decreasing, from what I have seen, during the last fifty years, for which I can give many proofs. (I may perhaps be allowed to mention, that I am descended from a family that was occupied at least two centuries in the Thames sand trade).

Even the gravelly portion of the bed of the river is not a permanent floor, for it is continually shifting in every direction. The material brought up from the bed of the river by the ballast engines is invariably *soiled river deposit*. In the Tunnel Report, March 7, 1843, it is stated that the ground excavated there varied greatly, being sometimes merely a loose river deposit. The Duke of Buccleuch's causeway, and that at King's-Arms-stairs, opposite, are now buried several feet in the mud, and have disappeared.

As my theory has hitherto been met by universal contradiction, I beg to add, that I have recently ascertained that the waters of the river Po have risen, owing to that stream carrying down and depositing so much mud and gravel; and that, consequently, the embankments there have from time to time been raised; and that they are now at least 22 feet higher than the general level of the adjacent plains. And I have just read in the Rev. Dr. Russell's "Egypt" (1832), that the river Nile has risen about 41 feet in 4,000 years.

I regret that my attention was only lately directed to the subject of the palatial Houses of Parliament.

February, 1847. T. HIGGS.

FOX-HUNTERS AND SANATORY REFORM.

IT was a striking and gratifying sign of the times to find Lord Lyttleton, the Lord-lieutenant of Worcester, at a fox-hunting dinner the other day, calling the attention of the company to the importance of sanatory reform. It speaks volumes for the cause, and more so still that the subject was actually received with "cheers" by the assembled fox-hunters! However strange it may appear, such was the fact. The remarks of the chairman were in allusion to Mr. Austin's recent report on the sanatory condition of the city of Worcester. "He (Lord Lyttelton) was most anxious to express his sense of its value, and hoped most sincerely that the mayor and all other authorities of the city would apply their very best energies to the recommendations of that report." * * * "He (Lord L.) felt deeply impressed with the subject, and therefore he had been anxious to take the first opportunity of introducing it." (Cheers.)

Imagine the puzzled look of the fox-hunters of the last generation on being so addressed! And that their successors in the field should actually cheer such an intrusion over their wine, was enough to disturb them in their very graves! But all honour to the men of high birth who, like Lord Lyttelton, shew their true nobility in efforts and examples such as this, for the welfare and improvement of their fellow-creatures!

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